

WHAT IS CLAIMED IS:

1. A liquid handling system, comprising:

a liquid handling substrate having a plurality of channels for conducting a liquid sample, said channels terminating in a plurality of exit ports in an outer surface of said substrate for transfer of a quantity of said liquid sample; and

a liquid storage and dispensing substrate having a plurality of cartridges corresponding to said channels, said cartridges terminating in a plurality of exit ports in an outer surface of said substrate for transfer of a quantity of said liquid sample, wherein

each said channel includes a reservoir in communication with a corresponding cartridge creating an interface therebetween,

and wherein

each said cartridge terminates at a dispensing device.

2. The liquid handling system of claim 1, wherein said dispensing device comprises a microelectro mechanical system (MEMS) comprising a membrane with a hole, a nozzle positioned adjacent to said hole on a side of said membrane and a piezoelectric element.
3. The liquid handling system of claim 1, wherein a liquid sample enters said channels of said liquid handling substrate by either capillary action, pneumatic means, electroosmotic flow, a minipump or a combination thereof.
4. The liquid handling system of claim 2, further comprising a liquid detecting means for detecting a level of a liquid sample in a cartridge.

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5. The liquid handling system of claim 4, wherein said liquid detecting means comprises a light emitting diode and a photo-detector.
6. The liquid handling system of claim 1, wherein said cartridges comprise a monolithic assembly.
7. The liquid handling system of claim 1, wherein said cartridges are separable.
8. The liquid handling system of claim 7, wherein said cartridges include an electrical conductor for supplying electrical energy to said liquid detecting means and said liquid storage and dispensing substrate.
9. The liquid handling system of claim 1, wherein the plurality of channels number up to approximately 1536.
10. The liquid handling system of claim 1, wherein the plurality of channels number approximately 96, 384 or 1536.
11. The liquid handling system of claim 7, wherein each said separable cartridge includes a registration mark on the outer surface of said cartridge.
12. The liquid handling system of claim 7, wherein each said separable cartridge includes an indexing mark on the outer surface of said cartridge.
13. The liquid handling system of claim 7, wherein each said separable cartridge includes a registration mark and an indexing mark on the outer surface of said cartridge.
14. The liquid handling system of claim 7, wherein said cartridges are separated using a multifunctional head, said head arrayed in a fountain, roller, conveyor belt or chain geometry.
15. The liquid handling system of claim 14, wherein said multifunctional head reads said cartridges.

16. A liquid handling system, comprising:

a liquid handling substrate having a plurality of channels for conducting a liquid sample in said substrate, said channels terminating in a plurality of exit ports in an outer surface of said substrate for transfer of a quantity of said liquid sample;

a liquid storage and dispensing substrate having a plurality of separable cartridges corresponding to said channels, said cartridges terminating in a plurality of exit ports in an outer surface of said substrate for transfer of a quantity of said liquid sample;

a liquid detecting system comprising a light emitting diode and a photo-detector, wherein

each said channel includes a reservoir in communication with a corresponding cartridge creating an interface therebetween,

and wherein

said liquid sample enters said channels wither by capillary action, pneumatic means, electro-osmotic flow, a minipump or a combination thereof.

17. In a liquid handling system, comprising:

a liquid handling substrate having a plurality of channels for conducting a liquid sample in said substrate, said channels terminating in a plurality of exit ports in an outer surface of said substrate for transfer of a quantity of said liquid sample;

a liquid storage and dispensing substrate having a plurality of separable cartridges corresponding to said channels, each said cartridge

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terminating at a microelectro mechanical system (MEMS) comprising a laminate of glass, silicon and a piezoelectric substance; and

a liquid detecting system comprising a light emitting diode and a photo-detector, wherein each said channel includes a reservoir in communication with a corresponding cartridge creating an interface therebetween, and wherein said liquid sample enters said channels wither by capillary action, pneumatic means, electro-osmotic flow, a minipump or a combination thereof,

a method for storing and dispensing liquids, comprising:

drawing a liquid sample into said channels either by capillary action, vacuum, electroosmotic flow, a minipump or any combination thereof;

storing said liquid sample into said cartridges; and

dispensing said liquid sample.